

Amendments to the claims:

1-37 (previously cancelled)

38. (currently amended) A method for modifying a condition of a material,
comprising:

obtaining a plurality of sensor readings associated with the condition of the
material as the material moves;

acquiring travel length information associated with the material as the material
moves; and

determining a deviation value associated with the condition of the material
based on at least some of the plurality of sensor readings; and

adjusting a load applied to the material as the material moves based on ~~the
plurality of sensor readings~~ the deviation value and the travel length information to
modify the condition of the material toward a desired condition.

39. (currently amended) A method as defined in claim 38, ~~further comprising
generating wherein the deviation value is a distance deviation value based on the plurality of
sensor readings.~~

40. (cancelled)

41. (previously presented) A method as defined in claim 38, further comprising
generating topographical information associated with a surface of the material based on the
travel length information and the plurality of sensor readings.

42. (previously presented) A method as defined in claim 38, further comprising determining a certification level of the material based on the plurality of sensor readings.
43. (currently amended) A method as defined in claim 38, wherein the plurality of sensor readings are generated by at least one of a contact sensor ~~and~~or a non-contact sensor.
44. (previously presented) A method as defined in claim 38, wherein adjusting the load applied to the material includes adjusting a position of a workroll to vary the load applied to the material.
45. (previously presented) A method as defined in claim 38, wherein the material is a strip material.

46. (currently amended) A system for modifying the flatness properties of a continuously moving material, the system comprising:
- a processor system; and
 - a memory communicatively coupled to the processor system, the memory including stored instructions that enable the processor system to:
 - obtain a plurality of sensor readings associated with the condition of the material as the material moves;
 - acquire travel length information associated with the material as the material moves; and
 - determine a deviation value associated with the condition of the material based on at least some of the plurality of sensor readings; and
 - adjust a load applied to the material as the material moves based on ~~the plurality of sensor readings~~ the deviation value and the travel length information to modify the condition of the material toward a desired condition.
47. (currently amended) A system as defined in claim 46, wherein the ~~stored instructions enable the processor system to generate~~ is a distance deviation value ~~based on the plurality of sensor readings~~.
48. (cancelled)

49. (previously presented) A system as defined in claim 46, wherein the stored instructions enable the processor system to generate topographical information associated with a surface of the material based on the travel length information and the plurality of sensor readings.

50. (previously presented) A system as defined in claim 46, wherein the stored instructions enable the processor system to determine a certification level of the material based on the plurality of sensor readings.

51. (currently amended) A system as defined in claim 46, wherein the plurality of sensor readings are generated by at least one of a contact sensor ~~and~~or a non-contact sensor.

52. (previously presented) A system as defined in claim 46, wherein the stored instructions enable the processor system to adjust a position of a workroll to vary the load applied to the material.

53. (previously presented) A system as defined in claim 46, wherein the material is a strip material.

54. (currently amended) A machine accessible medium having instructions stored thereon that, when executed, cause a machine to:

obtain a plurality of sensor readings associated with the condition of the material as the material moves;

acquire travel length information associated with the material as the material moves; and

determine a deviation value associated with the condition of the material based on at least some of the plurality of sensor readings; and

adjust a load applied to the material as the material moves based on ~~the plurality of sensor readings~~ the deviation value and the travel length information to modify the condition of the material toward a desired condition.

55. (currently amended) A machine accessible medium as defined in claim 54 having instructions stored thereon that, when executed, cause the machine to generate a distance deviation value based on the at least some of the plurality of sensor readings.

56. (cancelled)

57. (previously presented) A machine accessible medium as defined in claim 54 having instructions stored thereon that, when executed, cause the machine to generate topographical information associated with a surface of the material based on the travel length information and the plurality of sensor readings.

58. (previously presented) A machine accessible medium as defined in claim 54 having instructions stored thereon that, when executed, cause the machine to determine a certification level of the material based on the plurality of sensor readings.

59. (previously presented) A machine accessible medium as defined in claim 54 having instructions stored thereon that, when executed, cause the machine to obtain the plurality of sensor readings from at least one of a contact sensor and a non-contact sensor.

60. (previously presented) A machine accessible medium as defined in claim 54 having instructions stored thereon that, when executed, cause the machine to adjust a position of a workroll to vary the load applied to the material.

61. (currently amended) A method of modifying a condition of a material, comprising:

translating the material past a sensor;

determining a plurality of deviation values of a surface~~distance values of a material~~, each of which corresponds corresponding to a different one of a plurality of zones associated with ~~a~~the surface of the material; and

automatically varying forces applied to the surface of the material in at least two of the plurality of zones to modify a condition of the material in one of the plurality of zones.

62. (previously presented) A method as defined in claim 61, wherein varying the forces applied to the surface of the material comprises varying a workroll plunge.

63. (previously presented) A method as defined in claim 61, wherein varying the forces applied to the surface of the material comprises varying a workroll center distance.

64. (previously presented) A method as defined in claim 61, further comprising acquiring travel length information associated with the material as the material moves and automatically varying the forces applied to the surface of the material based on the travel length information.

65. (currently amended) A method as defined in claim 64, further comprising determining a plurality of peak values for each of the plurality of zones based on the plurality of ~~surface distances~~ deviation values.

66. (currently amended) A method as defined in claim 65, wherein determining the plurality of peak values includes determining ~~a plurality of distance deviation values~~ a minimum deviation value or a maximum deviation value based on the plurality of ~~surface distance deviation~~ deviation values.

67. (previously presented) A method as defined in claim 65, wherein varying the forces applied to the surface of the material is based on the plurality of peak values.

68. (previously presented) A method as defined in claim 61, further comprising acquiring a travel length value associated with the material using an encoder.

69. (currently amended) A method as defined in claim 61, wherein the plurality of ~~surface distance deviation~~ values are determined using at least one of a contact sensor and a non-contact sensor.

70. (previously presented) A method as defined in claim 61, further comprising determining a certification level of the material based on flatness properties of the material.

71. (previously presented) A method as defined in claim 61, wherein the forces applied to the material are imparted by a workroll.

72. (previously presented) A system for conditioning a moving material, the system comprising:

- a sensor that detects a distance to a surface of the moving material;
- a controller communicatively coupled to the sensor and configured to obtain a distance value associated with the distance to the surface of the moving material; and
- a roller operatively coupled to the controller, wherein the controller varies a position of the roller to vary a load applied to the moving material to achieve a desired condition of the moving material.

73. (previously presented) A system as defined in claim 72, further comprising an encoder communicatively coupled to the controller and configured to measure a travel length value associated with the moving material.

74. (currently amended) A system as defined in claim 72, wherein the sensor is one of a contact sensor ~~and~~or a non-contact sensor.

75. (previously presented) A system as defined in claim 72, wherein the moving material is a strip material.

76. (previously presented) A system as defined in claim 72, wherein the load is associated with at least one of a threshold distance value and an average distance value generated based on the distance value.

77. (currently amended) A method of leveling strip material, the method comprising:

moving the strip material past a first sensor and a second sensor;

obtaining a first plurality of readings from the first sensor;

obtaining a second plurality of readings from the second sensor;

~~detecting~~determining a deviation value associated with a leveling condition of the strip material based on a comparison at least one of the first plurality of readings ~~to~~and at least one of the second plurality of readings; and

generating an electrical signal to cause an adjustment of a load applied to the strip material in response to ~~detecting the leveling condition~~ the deviation value.

78. (currently amended) A method as defined in claim 77, wherein ~~detecting the leveling condition~~ determining the deviation value comprises:

determining a first average for the first plurality of readings;
determining a second average for the second plurality of readings; and
determining a difference between the first average and the second average.

79. (previously presented) A method as defined in claim 77, wherein moving the strip material past the first sensor and the second sensor comprises moving the strip material past at least one non-contact sensor.

80. (currently amended) A method as defined in claim 77, wherein moving the strip material past the first sensor and the second sensor comprises moving the strip material past at least one of an acoustic sensor, an optical sensor, ~~and~~ or a riding needle sensor.

81. (previously presented) A method as defined in claim 77, further comprising determining a length associated with the strip material based on an input from an encoder.

82. (previously presented) A method as defined in claim 77, wherein causing the adjustment of the load comprises causing a change in a workroll plunge.

83. (previously presented) A method as defined in claim 82, wherein causing the change in the workroll plunge comprises adjusting a hydraulic cylinder operatively coupled to a backup bearing.

84. (previously presented) A method as defined in claim 77, wherein causing the adjustment of the load comprises causing a change in a workroll center distance.

85. (currently amended) A method of conditioning a material, the method comprising:

- moving the material past a sensor;
- ~~detecting a~~ determining a deviation value associated with a material condition
~~associated with~~ of the material as the material passes the sensor;
- determining a distance between a first sensor reading location and a second sensor reading location; and
- generating an electrical signal to cause an adjustment of a force applied to the material based on the ~~material condition~~ deviation value and the distance.

86. (currently amended) A method as defined in claim 85, wherein moving the material past the sensor comprises moving the material past at least one of an acoustic sensor ~~and~~ or an optical sensor.

87. (cancelled)

88. (previously presented) A method as defined in claim 85, wherein determining the distance between the first sensor reading location and the second sensor reading location comprises receiving a signal from an encoder.

89. (previously presented) A method as defined in claim 85, wherein causing the adjustment in the force applied to the material comprises causing a change in a workroll plunge.

90. (previously presented) A method as defined in claim 89, wherein causing the change in the workroll plunge comprises adjusting a hydraulic cylinder.

91. (previously presented) A method as defined in claim 85, wherein causing the adjustment in the force applied to the material comprises causing a change in a workroll center distance.

92. (currently amended) An apparatus to condition a material, comprising:
a roller configured to condition the material;
a sensor positioned to measure a distance ~~based on the location of~~ to a surface of the material ~~and the location of the sensor~~; and
a controller operatively coupled to the roller and the sensor, wherein the controller is configured to generate an electrical signal in response to the distance, and wherein the roller is adjusted based on the electrical signal to condition the material.

93. (previously presented) An apparatus as defined in claim 92, further comprising a hydraulic cylinder operatively coupled to the controller and configured to adjust the roller in response to the electrical signal.

94. (previously presented) An apparatus as defined in claim 93, further comprising a backup bearing operatively coupled to the hydraulic cylinder and the roller, wherein the backup bearing causes a change in a plunge associated with the roller.

95. (previously presented) An apparatus as defined in claim 92, wherein the sensor comprises an acoustic sensor.

96. (previously presented) An apparatus as defined in claim 92, wherein the sensor comprises an optical sensor.

97. (previously presented) An apparatus as defined in claim 92, further comprising an encoder operatively coupled to the controller, wherein the controller is configured to use the encoder to determine a distance between a first sensor reading location and a second sensor reading location.

98. (currently amended) An apparatus as defined in claim 92, wherein the controller is configured to cause the generation of a certification information associated with the material.

99. (previously presented) An apparatus as defined in claim 98, further comprising a printer operatively coupled to the controller to print at least some of the certification information.

100. (previously presented) An apparatus as defined in claim 98, further comprising a display device operatively coupled to the controller to display at least some of the certification information.

101. (currently amended) A method of modifying a condition of a material, comprising:

obtaining a first deviation value associated with a material condition of a first zone of the material as the material moves;

obtaining a second deviation value associated with the material condition of a second zone of the material as the material moves; and

adjusting a load applied to the first zone of the material based on a comparison of the first ~~material condition and the second material condition~~ and second deviation values.

102. (currently amended) A method as defined in claim 101, wherein the first ~~material condition~~ deviation value is obtained by determining a first average deviation based on a first plurality of sensor readings associated with the first zone of the material, and wherein the second ~~material condition~~ deviation value is obtained by determining a second average deviation based on a second plurality of sensor readings associated with the second zone of the material.

103. (currently amended) A method as defined in claim 101, wherein adjusting the load applied to the first zone of the material comprises determining that the first zone of the material is not flatter than the second zone of the material based on the comparison of the ~~first material condition to the second material condition~~ and second deviation values.

104. (currently amended) A method as defined in claim 101, wherein the first ~~material condition deviation value~~ is represented using a first I-unit value and the second ~~material condition deviation value~~ is represented using a second I-unit value.

105. (previously presented) A method as defined in claim 104, wherein the first I-unit value is determined based on a peak value and a span value associated with the first zone.

106. (previously presented) A method as defined in claim 105, wherein the peak value is calculated by multiplying a first zone average value by two and subtracting the known thickness of the material from the result of the multiplication.

107. (previously presented) A method as defined in claim 105, wherein the span value is calculated by dividing a length of the first zone by a number of peaks in the first zone.

108. (currently amended) A method as defined in claim 101, wherein adjusting the load applied to the first zone comprises adjusting the load applied to the first zone and a third zone based on the comparison of the first material condition and the second material condition and second deviation values.

109. (currently amended) A method of modifying a condition of a material, comprising:

obtaining a first plurality of sensor readings associated with a first zone of the material as the material moves, wherein at least some of a plurality of values associated with the first plurality of sensor readings deviate from one another;

obtaining a second plurality of sensor readings associated with a second zone of the material as the material moves;

determining a first value based on the first plurality of sensor readings;

determining a second value based on the second plurality of sensor readings;

and

adjusting a load applied to the second zone of the material as the material moves based on a comparison of the first and second values.

110. (previously presented) A method as defined in claim 109, wherein each of the first and second values is selected from the group consisting of an average deviation value, a maximum deviation value, an I-unit, and a square root of a sum of squares of deviation values.

111. (previously presented) A method as defined in claim 109, further comprising acquiring a travel length value associated with the material as the material moves and adjusting the load applied to the second zone of the material based on the travel length value.

112. (previously presented) A method as defined in claim 109, further comprising comparing the first and second values to a predetermined threshold value associated with a substantially flat condition and adjusting the load applied to the second zone of the material based on the comparison of the first and second values to the predetermined threshold value.

113. (currently amended) A method of modifying a condition of a material, comprising:

obtaining a first ~~condition~~-deviation value associated with a first zone of the material as the material moves;

comparing the first ~~condition~~-deviation value ~~with~~ to a threshold value associated with a desired condition of the material; and

adjusting a load applied to a second zone of the material as the material moves based on the comparison of the first ~~condition~~-deviation value ~~and to~~ the threshold value.

114. (currently amended) A method as defined in claim 113, wherein the first ~~condition~~-deviation value is selected from the group consisting of an average deviation value, a maximum deviation value, an I-unit, and a square root of a sum of squares of deviation values.

115. (currently amended) A method as defined in claim 113, further comprising adjusting a third zone of the material as the material moves based on the comparison of the first ~~condition~~-deviation value and ~~to~~ the threshold value.

116. (currently amended) A method as defined in claim 113, further comprising:
obtaining a second ~~condition~~-deviation value associated with the second zone of the material as the material moves;
comparing the first ~~condition~~-deviation value and ~~to~~ the second ~~condition~~-deviation value; and
adjusting a first load applied to the first zone and a second load applied to the second zone of the material as the material moves based on the comparison of the first ~~condition~~-deviation value and ~~to~~ the second ~~condition~~-deviation value.

117. (currently amended) A method as defined in claim 116, wherein the load applied to the first zone and the second zone of the material is adjusted based on the first ~~condition~~-deviation value.